

THREE NEW SPECIES OF TIPHIA FROM EASTERN ASIA

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INTRODUCTION

In 1930 Allen and Jaynes, who were studying the taxonomy of Asiatic *Tiphia*, submitted certain specimens from China and Korea to A. B. Gahan for comparison with types in the British Museum. Gahan reported that, except for being somewhat smaller, the females seemed to be the same as the type female of *T. malayana* Cameron,² the male at that time being unknown. Allen and Jaynes subsequently published a description of the male together with descriptive notes on the female, under the name of *T. malayana* Cam.³

In the course of the rearing work at the Yokohama laboratory with *Tiphia* from Japan proper, which the author and his associates at first thought to be the same as the species from Chosen (Korea) known as *T. malayana* Cam., differences in their biology were observed which distinguished them from specimens from Chosen that had been considered to be the same form. These differences in habit prompted a closer investigation of the characters and characteristics of the two. These studies led to the discovery of differences between those from Chosen, designated as *T. malayana* Cam., by Allen and Jaynes, and specimens from Japan thought to be that species. Comparative studies made of

¹ Grateful acknowledgment is made of the assistance of H. W. Allen, whose suggestions, criticisms, and advice have been indispensable. Thanks are also due to K. Sato, who first pointed out the existence of differences between the Japanese and Chosenese species mentioned herein, and to C. H. Hadley and J. L. King for their counsel and encouragement during the preparation of this paper.

² *Tiphia malayana* Cameron, Entom. Runds., 27 Jahrg., p. 130. 1910.

³ Contribution to the Taxonomy of Asiatic Wasps of the Genus *Tiphia*. (Scoliidae). H. W. Allen and H. A. Jaynes. No. 2814—From the Proceedings of the United States National Museum, Vol. 76, Art. 17, pp. 1-105, pls. 1-4. 1930.

specimens from Japan, Chosen, and China revealed differences by which material from the three regions could be distinguished. After making a close study of Gahan's notes on the type female of *T. malayana* Cam. from Borneo, the author concluded that none of the three species which were being identified as *malayana* actually belonged to that species. This conclusion is supported by the general fact that related species of the genus are believed to have rather limited distribution. In order that the three species discussed in this paper may be more readily distinguished from one another and less likely to be confused with *T. malayana* Cam., the author has described the distinguishing characters of each.

Since the description of *frater*, as given herein, applies specifically to the specimens from Chingkiang, China, the author wishes to point out that specimens which he examined from Kuliang, China, and which were originally included by Allen and Jaynes under the name *malayana*, though identical with *frater* in most characters, have not been included in the species. The reason for this discrimination is based upon the existence of characters which, in the writer's opinion, should be given more study in the light of possible new species before they are permitted to complicate one just established. The description of the male by Allen and Jaynes, under the name *malayana*, was based upon a selected specimen from Kuliang, China. As this is now known to be different from both the true *malayana* from Borneo and *frater* from Chinkiang, it naturally follows that neither of those names can be correctly applied to the species which this specimen represents. All three of the new species described here key out to couplet 28 in the key by Allen and Jaynes, but may be separated further by the use of the character differences given in the accompanying key.

As the terminology and phraseology used in this manuscript follow those used by Allen and Jaynes in "Contribution to the Taxonomy of Asiatic Wasps of the Genus *Tiphia*. (Scoliidae)," reference to that publication should be made for definition of terms.

KEY FOR SEPARATION OF SPECIES

Females

- A. Propodeal areola with sides parallel *T. frater*, n. sp.

Propodeal areola with sides not parallelB

B. Punctures of punctate transverse discal band of pronotum noticeably differentiated; punctate area on dorsum of pronotum divided by a narrow medial prolongation of the impunctate apex.....

.....*T. satoi*, n. sp.

Punctures of punctate transverse discal band of pronotum not differentiated; punctate area on dorsum of pronotum not divided by a prolongation of the impunctate apex.....*T. sternata*, n. sp.

Males

A. First sternite with distance from escutcheon to posterior sulcus two-thirds as long as sulcus*T. frater*, n. sp.

First sternite with distance from escutcheon to posterior sulcus at least slightly greater than length of sulcus.....B

B. First tergite with preapical band of punctures narrow, seldom abruptly impressed on anterior margin, all medial punctures in band differentiated*T. sternata*, n. sp.

First tergite with preapical band of punctures narrow, usually abruptly impressed on anterior margin, with punctures differentiated only on posterior border*T. satoi*, n. sp.

Tiphia frater new species

Tiphia malayana Allen and Jaynes, not Cameron (in part).

FEMALE.—Vertex with primary punctures largely of third-degree density, with medial patch slightly denser than patches on either side; several minute punctures on medial line near posterior declivity. Front lightly shagreened on lower half; usually no impunctate stripe; primary punctures of first-degree density from eye to eye on lower third and upward to vertex along inner orbits, of third-degree density in front of ocelli; upper half with interspaces distinctly larger than ocellus. Clypeus slightly bilobate; length of impunctate margin nearly one-half as great as the distance from apex of clypeus to edge of antennal fossa. Antenna with third joint distinctly shorter than its greatest width; flagellum fulvous beneath. Dorsum of pronotum with primary punctures of uniform size and well differentiated from secondaries, of first-degree density except for small latero-discal spots; transverse discal band not differentiated. Transverse carina obsolete medially. Side of pronotum with a deep continuous groove across the center, but lacking other conspicuous sculpturing. Metanotum with the largest punctures much finer than those of scutellum. Legs with major calcarium of hind tibia distinctly widest at bend near middle; hind basitarsus with a shallow groove at least half the length of the joint, outside with a row of three long, lanceolate spines, one of which is apical. Tegula red to black, semitransparent, inner posterior angle produced and densely pilose, with several suberect hairs rising above the tegula when viewed from across the dorsum. Wings faintly smoky; stigma more than twice as long as wide, extending distally in a

broad curve from junction with radius. Propodeal areola with sides parallel; from two to two and one-half times as long as wide; carinæ sharp and narrow, bordered with well developed grooves; median carina extending nearly to the transverse carina. Lower portion of sides of propodeum shagreened, usually with a large patch of very minute setigerous punctures. Posterior aspect of propodeum with carina flattened, bordered by shallow impressions. First abdominal tergite with apical band consisting of punctures about one row wide at center, widening at sides into depressed patches of coalesced punctures. First sternite with lateral grooves on posterior three-fourths; other fourth coriaceous; disk lacking the usual dense minute punctures posteriorly. Tergites with preapical setigerous punctures becoming more nearly discal medially where impunctate nonmembranous apices are at least four times width of near-by primary punctures; row of minute punctures appearing on sides, but not on dorsum back of the row of preapical setigerous punctures. Pygidium reticulo-punctate on basal half, with a conspicuous median impunctate indentation; apex smooth. Length 7.5 to 10.5 mm.

MALE.—Vertex with primary punctures in dense medial patch of first-degree density. Front strongly shagreened; preocellar area with primary punctures of regular second-degree and third-degree density and with interspaces much broader than an ocellus; secondary punctures nearly lacking, though primaries gradually diminish in size toward base of antennæ. Antennocular distance less than the width of antennal fossa. Clypeal extension with its apical width two-thirds as great as distance from apex of clypeus to edge of antennal fossa; disk conspicuously shagreened; apex without impunctate border, distinctly emarginate. Antenna with flagellum often broadly infusate beneath. Pronotum faintly shagreened; primary punctures small and largely of third-degree density; several secondary punctures antero-medially. Side of pronotum striate, with strong groove, more or less interrupted by diagonal rugulæ, crossing center in broad curve; several punctures along upper border. Mesepisternum shagreened; primary punctures diminishing in size and density away from prepectus; secondary punctures conspicuously less numerous than primaries over a vaguely defined area in center anterior to spiracle. Scutellum without impunctate apex as wide as hindmost primary punctures. Metanotum variable. Tibiæ and femora sometimes partly reddish. Tegula polished, varying from translucent reddish to opaque black. Wings subhyaline, with radial cell exceeding second cubital cell in apical extension. Propodeum with its transverse carina extending far forward medially; areola about twice as long as its posterior width, its sides slightly convergent caudad, the groove on outer borders of lateral carinæ somewhat crenulate; median carina tapering to apex, which is situated just before transverse carina; enclosed area flat, granulate; lower portion of sides of propodeum densely striate, not finely hairy or punctate; posterior aspect densely hairy, punctate except on the conspicuous, polished, impunctate spots above, with a median carina present on lower half or less. First tergite with preapical band narrow, usually abruptly impressed on anterior margin, with punctures differentiated only on posterior border. First sternite with disk

polished, impunctate, the lateral grooves extending forward a variable distance, sometimes to anterior apex; constricted portion with an elongate median keel; distance from escutcheon to posterior sulcus one-third greater than length of sulcus. Tergites 3 to 5 with punctures not clearly outlined, apical ones larger than the more densely grouped anterior ones; impunctate margins narrow, scarcely twice as wide as width of largest adjacent primary punctures. Length 5 to 7 mm.

Distribution.—Chinkiang, China.

The following specimens were in the series studied for the descriptive work.

Type and allotype.—No. 50740 U. S. National Museum type, female, and allotype, male, Chinkiang, China, July 7, 1924 (H. A. Jaynes).

Paratypes.—In the U. S. National Museum: One female from Chinkiang, China, July 20, 1924 (J. F. Illingworth); one male from Chinkiang, China, July 7, 1924. Deposited in the collection of the Academy of Natural Sciences of Philadelphia: One female from Chinkiang, China, July 20, 1924 (J. F. Illingworth); one male from Chinkiang, China, July 7, 1924. Retained in the collection of the Japanese and Asiatic beetle laboratory: One male from Chinkiang, China, July 4, 1924; one female from Chinkiang, China, July 7, 1924 (H. A. Jaynes); one female from Chinkiang, China, July 20, 1924, and one male from Chinkiang, China, July 7, 1924 (J. F. Illingworth).

***Tiphia sternata* new species**

FEMALE.—Vertex with primary punctures largely of third-degree density, with medial patch slightly denser than patches on either side; several minute punctures on median line near posterior declivity. Front slightly shagreened on lower half, usually no impunctate stripe; primary punctures of first-degree density from eye to eye on lower third and upward to vertex along inner orbits, of third-degree density in front of ocelli, several interspaces as wide as an ocellus. Length of impunctate margin of clypeal extension nearly one-half as great as distance from apex of clypeus to edge of antennal fossa. Antennæ with third joint slightly shorter than its greatest width; flagellum fulvous beneath. Dorsum of pronotum distinctly though not heavily shagreened in punctate area, with primary punctures of uniform size and well differentiated from secondaries, of first-degree density except for small latero-discal spots; transverse discal band not differentiated. Side of pronotum with a deep, continuous groove across the center, but lacking other conspicuous sculpturing. Metanotum with the largest punctures much finer

than those of the scutellum. Legs with major calcarium of hind tibia distinctly widest at bend near middle; hind basitarsus with shallow groove at least half the length of joint, outside with a row of three long, lanceolate spines, one of which is apical. Tegula reddish to black, rarely transparent; inner posterior angle produced and densely pilose with several suberect hairs rising above tegula when viewed from across dorsum. Wings faintly smoky; stigma more than twice as long as wide, extending distally in broad curve from junction with radius. Sides of propodeal areola distinctly concave, broader anteriorly, from two to three times as long as its posterior width; carinae sharp and narrow, bordered with well developed grooves; median carina ending just before transverse carina. Lower portion of sides of propodeum shagreened, usually with a large patch of very minute setigerous punctures. Posterior aspect of propodeum with median carina flattened, bordered by shallow impressions, and extending to transverse carina. First abdominal tergite with preapical band consisting of punctures about one row wide at center, widening at the sides into depressed patches of coalesced punctures. First sternite with lateral grooves on posterior three-fourths, ending in a series of interrupted impressions; other fourth coriaceous; disk with punctures microscopic and sparse. Tergites with preapical setigerous punctures becoming more nearly discal medially where impunctate, nonmembranous apices at least four times width of near-by primary punctures; a row of minute punctures appearing on sides, but not on dorsum back of preapical row of setigerous punctures. Pygidium uniformly reticulo-punctate on basal half, with a conspicuous median impunctate indentation; apex smooth. Length 8 to 10 mm.

MALE.—Vertex with primary punctures in dense medial patch of first-degree density. Front strongly shagreened; preocellar area with primary punctures of regular second-degree and third-degree density and usually with interspaces as broad as an ocellus; secondaries nearly lacking though primaries diminishing in size toward base of antennae. Antennocular distance about one-half width of antennal fossa. Clypeal extension with its apical width seldom as great as distance from apex of clypeus to edge of antennal fossa; disk perceptibly convex and broadly shagreened; apex distinctly roundly emarginate, without impunctate border. Antennae wholly black. Pronotum faintly shagreened; primary punctures small, and largely of third-degree density; several secondary punctures antero-medially. Side of pronotum striate, with strong groove, more or less interrupted by diagonal rugulae, crossing center in a broad curve; several punctures along upper margin. Mesepisternum conspicuously shagreened, primary punctures diminishing in size and density away from prepectus, everywhere of third-degree density; secondary punctures conspicuously less numerous than primaries over a vaguely defined area in center anterior to spiracle. Scutellum without impunctate apex as wide as lowest primary punctures. Metanotum variable. Legs with tibiae and femora usually black. Tegula opaque black, polished and faintly shagreened. Wings subhyaline with radial cell exceed-

ing second cubital cell in apical extension. Propodeum with its transverse carina extending far forward medially; areola about one and one-half times as long as posterior width, its sides slightly convergent caudad; the groove on outer borders of lateral carinae somewhat crenulate, median carina tapering to apex, which is situated just before transverse carina; enclosed area flat, granulate; lower portions of sides of propodeum densely striate, not finely hairy or punctate; posterior aspect densely hairy, punctate except on the conspicuous, polished, impunctate spots above, with a median carina present on lower half or less. First tergite with preapical band seldom impressed on anterior margin, all medial punctures in band differentiated. First sternite with distance from escutcheon to posterior sulcus about one and one-half times length of sulcus; disk polished, impunctate, with lateral grooves on posterior half; constricted portion with elongate median keel. Tergites 3 to 5 with punctures not clearly outlined, apical ones larger than the more densely grouped anterior ones; impunctate margins at most about three times as wide as width of largest adjacent primary punctures. Length 5 to 7 mm.

Distribution.—Obuse, Shimajima, Ueda, and Kamisuwa in Nagano prefecture, Japan; Kagamigahara in Gifu prefecture, Japan; Nasu in Tochigi prefecture, Japan; Tokyo, Japan; Hashimoto and Yokohama in Kanagawa prefecture, Japan; Yukuhashi, Kyushu, Beppu, Kujyu, Asaji, Makiguchi, Shimabara, and Unzen on the Island of Kyushu, Japan.

The following specimens comprised the series used for the descriptive work.

Type and allotype.—No. 50741 U. S. National Museum type, female, Yokohama, Japan, May 19, 1931, (S. Fujii). Allotype, male (reared), Yokohama, Japan, November 10, 1932 (L. B. Parker).

Paratypes.—In the collection of the U. S. National Museum: Three females, Yokohama, Japan, May 19, 1931 (S. Fujii); one male (reared), Yokohama, Japan, November 5, 1932. Deposited in the collection of the Academy of Natural Sciences of Philadelphia: Two females, Yokohama, Japan, May 9, 1931, and 1 female, Hashimoto, Japan, June 9, 1931 (S. Fujii); one male (reared), Yokohama, Japan, October, 1932. Retained in the collection of the Japanese beetle laboratory: One female, Hashimoto, Japan, June 9, 1931; one female, Yokohama, Japan, May 19, 1931 (S. Fujii); one female (reared), Yokohama, Japan, October 31, 1931; one male (reared), Yokohama, Japan, October,

1932. At the time the previously mentioned descriptive notes by Allen and Jaynes were written this species was not known. It now appears, however, that *sternata*, while a separate species, more closely resembles *frater* from Chinkiang, China, than *satoi* from Chosen. *T. sternata* has been known to workers on the Japanese and Asiatic Beetle Investigations as *Tiphia* sp. No. 6-b.

***Tiphia satoi* new species**

Tiphia malayana Allen and Jaynes, not Cameron (in part).

FEMALE.—Vertex with primary punctures largely of third-degree density, with medial patch slightly denser than patches on either side, several minute punctures on medial line near posterior declivity. Front usually polished but with no impunctate stripe; primary punctures of first-degree density from eye to eye on lower third and upward to vertex along inner orbits, of third-degree density in front of ocelli, with several interspaces as wide as an ocellus. Length of impunctate margin of clypeal extension nearly one-half as great as the distance from apex of clypeus to edge of antennal fossa. Antenna with third joint distinctly shorter than its greatest width; flagellum fulvous beneath. Pronotum with primary punctures on dorsum of uniform size and well differentiated from secondaries, usually slightly less dense in an area just anterior to the transverse discal band except where a narrow medial prolongation of the impunctate apex divides the punctate area, reaching to the transverse discal band, rarely separated from it by the width of one puncture. Side of pronotum with a deep, continuous groove across the center, but lacking other conspicuous sculpturing. Metanotum with the large punctures much finer than those of scutellum. Legs with major calcarium of hind tibia distinctly widest at bend near middle; hind basitarsus with a shallow groove at least half length of joint, outside with a row of three long lanceolate spines, one of which is apical. Tegula polished, black, with a translucent reddish border; inner posterior angle produced and densely pilose. Wings faintly smoky; stigma more than twice as long as wide, extending distally in a broad curve from junction with radius. Sides of propodeal areola at most slightly concave, areola expanded anteriorly, "keystone" shaped, from two and one-half to three times as long as posterior width; carinae sharp and narrow, bordered by well developed grooves; median carina ending just before transverse carina. Lower portion of side of propodeum shagreened, usually with a large patch of very minute setigerous punctures. Posterior aspect of propodeum with median carina flattened, bordered by shallow impressions, and extending from the lower transverse carina to the upper transverse carina. First abdominal tergite with apical band consisting of punctures about one row wide at center, widening at sides into depressed patches of coalesced punctures. First sternite with lateral grooves on posterior three-fourths; other fourth coriaceous; disk with punctures becoming sparse and microscopic posteriorly. Tergites with pre-

apical setigerous punctures becoming more nearly discal medially where impunctate nonmembranous apices are at least four times width of near-by primary punctures; a row of minute punctures appearing on sides, but not on dorsum, back of preapical row of setigerous punctures. Pygidium uniformly reticulo-punctate on basal half, with a conspicuous median impunctate indentation; apex smooth. Length 8 to 10.5 mm.

MALE.—Vertex with primary punctures in dorso-medial patch of first-degree density. Front strongly shagreened; preocellar area with primary punctures of regular second-degree and third-degree density and with interspaces broader than an ocellus; secondary punctures nearly lacking, though primaries gradually diminishing in size toward base of antennæ. Antennocular distance almost as great as width of antennal fossa. Clypeal extension with its apical width distinctly less than the distance from apex of clypeus to edge of antennal fossa; disk perceptibly convex; apex roundly emarginate, without impunctate margin. Antennæ wholly black. Pronotum faintly shagreened dorsally, with primary punctures small and largely of third-degree density; several secondary punctures antero-medially. Sides of pronotum striate, with strong groove more or less interrupted by diagonal rugulæ, crossing center in a broad curve; several punctures along upper margin. Mesepisternum conspicuously shagreened; primary punctures diminishing in size and density away from prepectus, everywhere of third-degree density; secondary punctures conspicuously less numerous than primaries over a vaguely defined area anterior to spiracle. Scutellum without impunctate apex as wide as hindmost primary punctures. Metanotum variable. Tibiæ and femora sometimes partially reddish. Tegula polished black. Wings subhyaline, with radial cell exceeding second cubital cell in apical extension. Propodeum with its transverse carina extending far forward medially; areola about twice as long as its posterior width; sides convergent caudad, the groove on outer borders of lateral carinæ somewhat crenulate; median carina tapering to apex, which is situated just before transverse carina; enclosed area flat, granulate; lower portion of sides of propodeum densely striate, not finely hairy or punctate; posterior aspect densely hairy, punctate except on the conspicuous, polished, impunctate spots above; median carina usually complete though faint posteriorly. First tergite with pre-apical band narrow, usually abruptly impressed on anterior margin, and with punctures differentiated only on posterior border. First sternite with disk polished, impunctate, with lateral grooves usually on lower half; constricted portion with an elongate median keel; distance from escutcheon to posterior sulcus slightly greater than length of sulcus. Tergites 3 to 5 with punctures not clearly outlined, apical ones larger than the more densely grouped anterior ones; impunctate margins at most about three times as wide as width of largest adjacent primary punctures. Length 5 to 7 mm.

Distribution.—Keisho Nan Do, Chusei Nan Do, and Keiki Do, Chosen (Korea).

The following specimens comprised the series studied for the descriptive work.

Type and allotype.—No. 50742 U. S. National Museum, type, female, and allotype, male, Gumpojo, Chosen, May 10, 1932 (L. B. Parker).

Paratypes.—Placed in the U. S. National Museum: One female, Gumpojo, Chosen, May 10, 1932; two females, Gumpojo, Chosen, May 9, 1932; and three males, Gumpojo, Chosen, May 11, 1932 (L. B. Parker). Deposited in the collection of the Academy of Natural Sciences of Philadelphia: One male and one female, Gumpojo, Chosen, May 9, 1932 (L. B. Parker); one female, Suigen, Chosen, June, 1931, and one male, Gumpojo, Chosen, May 9, 1932 (K. Sato). Retained in the collection of the Japanese beetle laboratory: One female, Suigen, Chosen, May 4, 1931 (H. Sugiura), and one female, Suigen, Chosen, May 4, 1931 (K. Sato); two males, Suigen, Chosen, May 5, 1931 (K. Sato). This species has been known to workers on the Japanese and Asiatic beetles project as *Tiphia* sp. No. 6-a.